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THE  
**Journal of the Society of Arts,**  
AND OF  
THE INSTITUTIONS IN UNION.

111TH SESSION.]

FRIDAY, NOVEMBER 18, 1864.

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*Announcements by the Council.*

ORDINARY MEETINGS.

Wednesday Evenings at 8 o'clock.

Nov. 23.—“On the Application of Iron to the Purposes of War and Naval Construction.” By W.M. FAIRBAIRN, Esq., LL.D., F.R.S. On this evening the Duke of Somerset, K.G., will preside.

Nov. 30.—“On the Mechanical Conditions of Railway Working to Prevent Destructive Wear and Risk.” By W. BRIDGES ADAMS, Esq.

DEC. 7.—“On the Construction, Retardation, Safety, and Police of Railway Trains.” By W. BRIDGES ADAMS, Esq.

CANTOR LECTURES.

There will be three Courses of “Cantor” Lectures on the following subjects during the ensuing Session :—

“On the Relation of Science and Art to Manufactures.” By B. WATERHOUSE HAWKINS, Esq., F.G.S., F.L.S.

“On the Application of Geology to the Arts and Manufactures.” By Professor D. T. ANSTED, M.A., F.R.S.

“On the Application of Chemistry to the Arts.” By Dr. F. CRACE CALVERT, F.R.S.

Mr. B. Waterhouse Hawkins will commence his course on Monday evening, the 12th of December.

These Lectures are open to Members free of charge, and a Member has the privilege of introducing ONE Friend to each Lecture. Particulars of the Courses will be duly announced in the *Journal*.

*Proceedings of the Society.*

FIRST ORDINARY MEETING.

Wednesday, November 16th, 1864; William Hawes, Esq., Chairman of Council, in the chair.

The following candidates were proposed for election as members of the Society :—

- Bickerstaff, William Martin, 13, Highbury-terrace, N.
- Bussell, Charles, 26, Soho-square, W.
- Clauson, Charles A. R. (Messrs. Rogers, Bros., and Co.), Naples.
- Altschul, Dr. D. H., 9, Old Bond-street, W.
- Clutton, Robert, Hartswood, Reigate.
- Craven, Joseph, Dole Mill, Thornton, near Bradford, Yorks.
- Crowther, Wm., Chemical Works, Gomersal, near Leeds.
- Darkin, Charles James, 21, Victoria-terrace, Finchley-road, N.W.
- Dyer, George, 90, Regent-street, W.
- Eskell, Abraham, 8, Grosvenor-street, W.
- Evans, John James, Rose-bank, Rock-park, Birkenhead.
- Field, John Lyon, Upper Marsh, Lambeth, S.
- Ford, Herbert, 8, Pier-road, Erith, S.E.; and 1, Charlotte-row, Mansion-house, E.C.
- Frean, G. H., Mill-street, Dockhead, S.E.
- Gilbert, Arthur, 12, Claverton-street, Pimlico, S.W.
- Green, German, 7, Helmet-row, Saint Luke's, E.C.
- Hannah, Robert, 2, Alfred-place West, Brompton, S.W.
- Hart, John Matthias, 76, Cheapside, E.C.
- Haysman, Jas., F.R.G.S., Burdett House, Burdett-rd., E.
- Holloway, Richard Welch (Lord Mayor of York), Mansion-house, York.
- Hudswell, W. S., New Railway Foundry, Leeds.
- Huggon, William, 30, Park-row, Leeds.
- Lainson, Henry, Heath-house, Reigate.
- Leycester, George Percival, 6, Oak Hill, Hampstead-road, N.W.
- Locket, George, Acton-house, Rosslyn-park, Hampstead, N.W.
- Mather, William, Chester-road, Manchester.
- Morres, Edward, 43, Parliament-street, S.W.
- Nosotti, Charles, 398, Oxford-street, W.
- Oertling, Ludwig (Ladd and Oertling), 27, Moorgate-st., E.C.
- Oram, John White, 7, Bank-buildings, E.C.
- Payne, James Bertrand, 44, Dover-street, W.
- Page, Nathaniel, Stag Brewery, Pimlico, S.W.
- Pankhurst, R. M., LL.D., South King-street, Manchester.
- Robinson, James Edward, Pontefract.
- Smith, Joseph, 3, Percy-villas, Wells-st., Hackney, N.E.
- Snooke, William, 6, Duke-street, London Bridge, S.E.
- Talbot, Robert, Strand-on-Green, Chiswick, W.
- Taylor, John, 45, Connaught-terrace, W.
- Tucker, Silas, 54, Canonbury-park south, N., and 234, High Holborn, W.C.
- Turnbull, Thomas, jun., Whitewell Dockyard, Whitby.
- Venables, William Vernon, 6, Queen-street-place, E.C., and 20, Canonbury-villas, N.

Wagstaff, John Henry, 9, Sheldon-street, Bishop's-road,  
Paddington, W.  
Walker, W., jun., J.P., Red Hall, Shadwell, near Leeds  
Watkins, Major-General, B.B., Albany, W.  
Watson, Edward Facon, 201, Piccadilly, W.  
Watson, Thomas, 19, Highbury-crescent, N.  
Wentworth, J. W. T. Vernon, Wentworth Castle, Barnsley  
Whiteside, R. B., 49, Lime-street, E.C.  
Whitford, Edward Edmondson, 55, Lansdowne-road,  
Kensington-park, W.  
Willing, James, 366, Gray's-inn-road, W.C., and South  
Lodge, Ham, S.W.  
Wilson, Captain J. H., 35, Pembridge-villas, Bayswater, W.  
Wilson, George, Nunthorpe Hall, York.  
Wilson, Thomas, 20, Gloucester-square, Hyde-park, W.  
Woodthorpe, Edmund, 28A, Basinghall-street, E.C.  
Wrenthmore, Francis, 250, Regent-street, W.  
Yallop, Thomas, 39, Norfolk-square, Hyde-park, W.

## AND AS HONORARY CORRESPONDING MEMBERS.

Bonghi, Cavaliere Diego, 38, Vico S. Giuseppe de Midi,  
Naples.  
Knight, J. G., Melbourne, Victoria.

The CHAIRMAN delivered the following  
ADDRESS.

My colleagues having done me the honour to elect me a second time to the office of Chairman of the Council of this Society, it becomes my duty to address you on the opening of the session 1864-65.

The important position the Society now holds among the educational and scientific institutions of this metropolis, the larger and broader views with which we are called upon to consider the various and important subjects to which our attention is necessarily directed, make it year by year more difficult to indicate in the opening address, in conformity with the bye-laws of the Society, the policy which is proposed to be pursued in each session; still this duty is imposed on the Council, and must be discharged; and I trust I shall show that the Council is now, as in previous years, fully alive to its duty.

In accordance with the ordinary custom followed by my predecessors, I must begin this annual address by paying a tribute of respect to the memory of the members of our Society whose loss by death we have to deplore during the past year. The number of members we have lost is unusually large—but as, under the improved management of our *Journal*, an obituary notice—where particulars have been obtained—of each member has appeared soon after his decease, it is unnecessary for me to do more this evening than notice those more especially distinguished in some branch of Arts, Manufactures, and Commerce.

Let me first state that the list of deceased members shows how we draw our members from all ranks and professions. The papers read before us are not, as in most other societies, devoted to one branch of science, and read to those whose attention has been especially

directed thereto; but papers relating to almost every branch of Art, Manufactures, and Commerce are either laid before the Council or read at our evening meetings to an audience which is brought together by the interest they take in each specific subject; and from this arises the peculiar freshness, vigour, and interest which distinguish our discussions, and which cannot be so often found at the meetings of any other society; to this must be attributed the fact of our members being derived from all classes of society.

We have lost in Lord Ashburton, who was a Vice-President of this Society, and for some time filled the office of President of the Geographical Society, a great patron of art, science, and literature, who devoted much of his time to the improvement of the moral and social condition of the working classes, and proved his desire to give a practical turn to education, by offering prizes to the scholars of the national schools for their knowledge of common things; and in 1854 he acted as chairman of one of our committees, which recommended that our Society should endeavour to promote the establishment of a normal school for the training of commercial schoolmasters.

In the Duke of Newcastle we have also lost a most distinguished member, whose engagements in public life prevented his taking so active a part as Lord Ashburton in the advancement of practical science, but who never failed to show great interest in whatever promoted the welfare of his country.

In art we have lost Mr. Dyce and Mr. J. D. Harding. Mr. Dyce, R.A., was the son of a physician at Aberdeen, where he was born in 1806, and educated at the Marischal College. He distinguished himself in early life by his attainments; and then, led by a love of art, entered the Schools of the Royal Scottish Academy. At the age of twenty he went to Italy, and spent sometime in the study of the great works of art at Rome and Florence, returning again in a few years to mature his earlier studies. After again passing two years on the Continent he returned to settle in Edinburgh, where he remained about eight years, devoted to historic art, in which he did not find encouragement, but practised chiefly as a portrait painter. Among his varied attainments he had acquired a knowledge of ornamental design; and in 1838 he was induced to accept the superintendence of the School of Design then established by the Government, and in that office and later, as Inspector and Member of the Council of the School, he continued his valuable aid towards its development till 1848, when he finally resigned. In the meanwhile, he had been one of the successful competitors in the Westminster Hall Fresco Exhibition, and in 1845

completed the first fresco on the walls of the new Legislative Palace—"The Baptism of St. Ethelbert." His previous studies, aided by a careful investigation and practice of the art of fresco-painting, had prepared him for the task, and his work was hailed as a success. In 1848 he was commissioned to decorate the Queen's Robing-room, with designs from "The Legend of King Arthur." Of these he only lived to complete five—one large and four smaller subjects, of unequal dimensions. The first typifies Hospitality—The admission of Sir Tristram to the Fellowship of the Round Table. The second, Religion or Faith—The vision of Sir Galahad and his Company. The third, Mercy—Sir Garwaine swearing to be Merciful and never to be against the Ladies. The fourth, Generosity—King Arthur, unhorsed, spared by Sir Launcelot. The fifth, Courtesy—Sir Tristram harping to La Reine Isonde. In these great works, the painter's genius, studied art, and profound learning and judgment have combined to produce a series of decorative paintings, stamped by a feeling of pure art, and admirably adapted by their skilful treatment to the decoration of the Palace. Mr. Dyce had, during his whole career, occasionally exhibited easel pictures; and he will be best remembered by his "King Joash shooting the arrow of deliverance," 1844; and his later works; "The Jacob and Rachel," 1853; "St. John leading home the Virgin," 1860; and "George Herbert, of Bemerton," 1861. His tastes were severe, his drawing and composition scholastic and accurate, and marked by a learned refinement. His colour positive, not graced by the refinements of tint, but well suited to the simplicity of his style. He died, 15th February, 1864, his death, it is to be feared, accelerated by the controversy which ensued on the delay in completing his frescoes in the Queen's Robing-room.

Mr. Harding also deserves notice in this address, although he did not occupy so high a position in Art as Mr. Dyce. He was a member of the old Water Colour Society, and his pictures obtained considerable celebrity, though he was, perhaps, better known to the public as the author of educational works relating to water-colour painting and drawing with the lead pencil, which still retain a high reputation, and are a most valuable contribution to the studies of the young artist and to the practical instruction of the amateur. It is not, I believe, too much to say that some popular art-critics owe a considerable portion of their success to the advantages they derived from constant association with Mr. Harding.

In practical mechanics we have to lament the death of Mr. Thomas Henry Maudslay, of London, and of Mr. Richard Roberts, of Manchester,

both distinguished for their great knowledge of mechanical engineering and for the large number of improvements they have introduced in machine tools and in steam and cotton machinery.

In agriculture we have lost Mr. Morton, the elder, and Mr. Beadel, both well known for the active part they took for many years at meetings of agricultural societies, where they always advocated the use of machinery and the most advanced system of farming, as the only means by which the agriculturalist could obtain a proper return for the industry and capital invested.

In literature we have lost Mr. Dilke. The connection of Mr. Dilke with the periodical literature of his time cannot fail to be interesting to our members, and deserves a special record in this address. During his long life he was connected with art, science, and literature, and was elected a member of this Society in 1849. He was almost the first to rely upon the desire of the great mass of the middle class to obtain information connected with art and literature, if it could be provided at a rate which would bring it within their reach; and, carrying this view into practical operation, he reduced, in the year 1831, the price of the *Athenaeum* from 8d. to 4d., at the same time enlarging its size and improving the character of its intelligence. At a later period, when connected with the *Daily News*, and before the repeal of the stamp duty on newspapers, in 1846, he reduced the price of this daily journal to 2½d.

In addition to these, I have to notice the death of Sir Wm. Brown, Bart., a distinguished merchant, who, having acquired a large fortune, became a most liberal donor to every institution likely to promote the improvement of the people, and but a year or two before his death built at his own expense and presented to the borough of Liverpool a magnificent library and museum, to be opened free to all the inhabitants of the borough.

In concluding this obituary notice I must not omit expressing the regret of the Council at the sudden loss of one of its younger but very active members, Mr. Frederick Lawrence, whose energy and talent made him a very valuable member of our body.

Before proceeding to the ordinary business of the evening, I must remind you of the very gratifying meeting of this Society which took place in Willis's Rooms, in June last, when His Royal Highness the Prince of Wales, our President, presided over a very large meeting of the Society, and performed, in a most gracious and pleasing manner, the duty of presenting the medals of the Society and other honourable rewards to the persons selected by the Council to receive them. The meeting was of unusual interest, not only on account of its being the first

occasion on which His Royal Highness had presided over a meeting of the Society, but also from the nature and number of the prizes distributed, and the distinguished characters of those who received them. The members are aware that a portion of the subscription raised to record the high sense the Society entertained of the great services rendered to it by its late lamented President, the Prince Consort, was appropriated to the execution of dies for a gold medal, to be given annually to whoever, in the opinion of the Council, had in the greatest degree promoted Arts, Manufactures, and Commerce. The Council, on this occasion of presenting the first medal, through the hands of His Royal Highness the President, selected, I may say by acclamation, Sir Rowland Hill, K.C.B., the originator of the penny postage, as well as of those most complicated arrangements required to carry this new system successfully into practical operation—a merit perhaps greater than that due to him for the original idea—as pre-eminently entitled to receive this testimony of his valuable services. It is not too much to say that Sir Rowland Hill, by this bold conception, has facilitated most materially the commercial transactions of the empire; has greatly promoted the progress of Arts and Manufactures; has given a stimulus to the desire of education amongst the rising generation; and, by facilitating the intercourse between all classes, has materially contributed to improve the social and moral condition of the people. No one will doubt his title to receive from this Society the first Albert Gold Medal. The next prize, the Swiney Prize, consisting of a silver goblet, value one hundred pounds, containing one hundred sovereigns, the proceeds of a legacy left to the Society by Dr. Swiney, to be given, once in every five years, to the "Author of the best published treatise on Jurisprudence," was, on the recommendation of a Committee, consisting of Vice-Chancellor Sir W. P. Wood, Sir Thos. Phillips, and G. W. Hastings, Esq., and others, adjudged to a distinguished civilian, Dr. Maine, a Member of the Supreme Council of India, and late Regius Professor of Civil Law at Cambridge, for his able treatise on "Ancient Law," a treatise which shows not only profound knowledge of the most abstruse principles of law, but the power of treating his subject with a simplicity of style and clearness of expression which render this valuable work interesting even to non-professional readers. Prizes were also given to Mr. Birch for the best design, with working drawings, for improved dwellings for the working classes; to Dr. Van Holst and Sir Wm. Holmes for the discovery and first importation of a sufficient quantity for commercial purposes, of a substitute for gutta percha; to the Artist-Workmen who had successfully competed for the prizes offered for

the best specimens of work executed in their own time; and to the successful competitors for the educational prizes and certificates awarded by your examiners.

In my address of last year, when announcing the policy the Council proposed to adopt during the then coming Session, I stated that, in justice to the Council, it was impossible to indicate the policy of any one year without referring to that of preceding years, or without considering the obligations undertaken for future years. I then endeavoured to show how persistently the Society, from its foundation, had promoted the study of the Fine Arts, first among the higher classes; and then, as other institutions were established to carry out a similar purpose, the Society adapted its plans to other classes requiring the stimulus which the publicity of the proceedings of a Society like ours affords. I also showed that we had steadily endeavoured to encourage the education of the industrial classes by the adoption of a system of competitive examination among the members of a large number of Mechanics' and other Educational Institutes in all parts of the country, and that a large measure of success had attended those efforts.

I now propose to show that in the encouragement of Manufactures and Commerce, and in the education of the Art-Workman, we have discharged and hope to continue to discharge an equally important duty. From 1761, when the first Exhibition of New Inventions was held in this house, to the present time, rewards have been constantly offered with a view to promote both Manufactures and Commerce. Commerce the Society promoted by offering prizes for the collection and introduction of new raw materials from all parts of the world. This branch of its duties it has consistently followed to the present time, for prizes, as I have already stated, were given at the last annual meeting for the discovery and introduction to our manufactures of a substitute for Gutta Percha. Time would fail me to enumerate various other vegetable and mineral substances which have been discovered and introduced into this country through the agency of this Society. It is sufficient for my purpose this evening broadly to state the fact, that Arts and Manufactures have been materially benefited by the stimulus the rewards offered by this Society has given to the discovery and importation of a large number of mineral and vegetable products. The Society also, for a great many years after its first establishment, allotted a considerable portion of its funds to the very important object of utilising waste lands by offering rewards, consisting either of the Society's medal or of money, for the purpose of encouraging the planting timber trees of all kinds according to the soils of the respective

districts. The number of trees thus planted, in consequence of the attention directed by the Society to this subject, must be numbered by millions; and no one can doubt the great benefit which has arisen from the value thus conferred upon this otherwise unproductive land. With regard to Manufactures, in the early stages of the Society many useful inventions were submitted to the Council in consequence of the rewards it offered; but the conditions necessarily imposed upon inventors who claimed such rewards that their inventions should become public property, precluded those who believed their inventions to be valuable from applying to the Society for its rewards; but in lieu thereof they appealed to the Patent Office for protection, whereby they hoped to secure the full pecuniary advantage to be derived from their discoveries. Still, notwithstanding this serious obstacle to the Society becoming the great vehicle for the communication of manufacturing improvements to the public, we find, in looking through its Transactions, various suggestions and new ideas, which were ultimately improved and perfected, and led to many important discoveries. But of all the measures the Society has undertaken, none perhaps have been so successful and have so strongly proved its usefulness, as the encouragement it gave, in a very early period of its existence, to the exhibition of works of industry and new inventions. From the date of the first exhibition, in 1761 to 1849, the Society held periodically exhibitions of various kinds, which gradually prepared the way for the favourable reception by the public of the great idea of the International Exhibition held in 1851. From that time to the present exhibitions have been admitted to be most efficient means for conveying to the public a true idea of the progress and state of the Arts, Manufactures, and Commerce of almost every country; and the Council cannot but view with extreme satisfaction the general acceptance of this mode of registering the degrees of industrial progress. A reference to the Index in the last number of our *Journal*, just published, will illustrate my view of the popularity of Exhibitions more thoroughly than any simple statement, for we find that during the past year no less than forty exhibitions have been held in all parts of the world, with a view of exhibiting specimens of Art, of Manufactures, and of natural products. I will not trouble you with reading the names of the places where these exhibitions have been held, as you will find them in the Index of the *Journal* to which I have referred. With regard, therefore, to Manufactures, we must consider the Society rather as a body collecting and publishing new ideas than the absolute originator of great discoveries. But, whilst admitting this, I must claim for the Society

the great merit of being nearly the first to direct public attention to the necessity of improving the dwellings of agricultural and manufacturing labourers, and for inviting discussion in these rooms on many of the most important questions calculated to improve their social and mental position. No member of this Society will forget the great interest taken in this subject by our late President, the Prince Consort, who not only was President of the Labourer Friends' Society, but built at his own expense model cottages, as an example to all who interest themselves in the improvement of the social condition of the industrial classes. It is well worthy of remark that as far back as 1779 prizes were offered by this Society for improving the cottages of agricultural labourers; and on a great many occasions, from that time to the present, questions relating to the social condition of particular trades and the effect of strikes, both upon masters and men, have received constant attention by the Society. I allude to these subjects, which are every year increasing in interest, to show how slowly though how certainly all great questions relating to the social condition of the industrial population of this country have advanced in public estimation, till at length the time has arrived when scarcely any one can be found who will justify the present condition or sufficiency of the house accommodation of the great mass of the people.

At the beginning of this year the Society brought out a report on dwellings improvement in the metropolis, which contains, in a condensed and convenient form a large amount of useful data, together with indications of various points on which further information was desirable. Some of this information has since been supplied in the form of communications inserted in the *Journal*; and as regards dwellings reform on the continent, a comprehensive and valuable collection of documents has been received from a Privy Councillor of Bavaria, of which an English abstract is now in preparation.

Towards the close of last session the Society held a Conference to consider the best means of improving the dwellings of the labouring classes, which was well attended, and elicited a great deal of useful and practical information. The main questions brought under discussion were, the cost of new cottages, whether when built if built with proper and decent accommodation, the labourer out of his ordinary wages could afford to pay a rent at all adequate to the cost. As a pure matter of financial investment, it was, I think, shown—and the practical experience of all who have thought on the subject coincides with this view—that no one would be likely to make any serious investment in cottage building; but to landowners and agri-

culturists this is but one part of the question, and perhaps the smallest, for if four or even three per cent. upon the capital invested could be realised, and the labourer thereby provided with decent and healthy accommodation close to his work, there can be no doubt that, besides the return upon the capital embarked in building, received as rent, they would obtain a very large increase in the quantity of work done by each labourer, an increase the value of which it would be difficult to measure in money, but equal to the toil now expended in walking, in all weathers, long distances to and from the place where he is employed, and to the improved health and consequent increased vigour of body which would certainly follow his living in a well-ventilated, well-drained cottage, close to his work. The question of improving the dwellings of the working classes cannot be considered simply as one of cost and wages, for it is quite impossible that improved dwellings to any great extent can be erected by the occupiers of the soil unless they hold their land on such terms that they are certain of obtaining an adequate return for the capital invested. I cannot this evening enter into the numerous questions involved in the consideration of this great subject. I will merely express my hope that the enlarged views with regard to leases, which have been recently expressed by Lord Stanley and others, will ere long so improve the tenure upon which a great proportion of the farms of this country are now held, that every landowner and occupier will find it to be his interest, in a social and pecuniary point of view, to provide proper house accommodation for the labourers on his estate. At the Conference, whilst a great deal of time was devoted to the consideration of the cost for which a new cottage could be built, attention was not I think sufficiently directed to the cheapness with which existing cottages might be enlarged, their drainage and water supply improved, and thus to a great extent rendered both healthy and commodious. I hope that this part of the subject at any future discussion will be fully considered, for it appears to me that by this means great improvements may be made at a comparatively small expenditure, whilst the idea even of the outlay required to build new cottages for the labourers on an estate deters many from giving the subject all the attention it requires. Such was the sympathy excited by the Conference to which I have referred, that the Council resolved to appoint a committee, consisting of gentlemen known to take an interest in this inquiry, and possessing practical knowledge of its details, to consider and report upon the great variety of questions which, in the opinion of the Council, tend to retard the improvement of the dwellings of the working

classes. The Council hope that the appointment of this committee will be of considerable service by placing this subject in a practical form before capitalists, landowners, and all interested in the welfare of the community at large, and will assist in removing an evil of great magnitude, the continued existence of which is a disgrace to our country, and most injurious to the welfare of the people; indeed it is hardly possible to understand the apathy that has existed in the minds of the middle and the upper classes upon this subject. It must be so thoroughly the interest of all to cultivate the moral feelings of the industrious classes, that it would appear to be almost one of the first and most essential conditions of employing labourers to provide them with suitable habitations. To preserve their health and that of their families would also appear to be not only the duty, but the interest, of landlords and manufacturers. Men of feeling ought to do this on principle, men without feeling from motives of self-interest. When we recollect that it is from those inhabiting the wretched accommodation in which a large portion of our poor reside that we take our domestic servants, in whom we place so much confidence, and who are so necessary to our comfort, it is difficult to estimate the advantages which would be derived by the public from the improvement in their characters and conduct which would follow their being removed from the over-crowded habitations in which they are now brought up. Indeed I believe there is no more baneful source of intemperance among working men and sickness among their families than is produced by their living in badly-ventilated and ill-drained houses, the atmosphere of which produces that lassitude and debility which they attempt to remove by resorting to spirituous liquors. In every point of view, then, whether of principle or interest, this subject deserves the utmost attention of the community at large. I cannot dismiss this subject without adverting to the present state of the laws affecting the relief and removal of the poor, which it may be hoped will be so far ameliorated as to diminish the objections which now prevail against the providing residences for the poor in the districts where they labour.

In connection with the progress of our manufactures and the prosperity of the working classes, the Society has also given its attention to the question of strikes—a question of almost equal importance to that which we have just considered. Strikes,—the existence of which in the aggravated form lately exhibited in Staffordshire, notwithstanding the great improvement which has taken place in the education of the people,—prove that something is still wanting to afford them individually and collectively a true knowledge of their own interests. This subject will,

I hope, be again brought before the Society during the coming Session. It appears to me that the legislation of the last two years, with regard to commercial and manufacturing companies, opens to working men an entirely new relationship to their employers, which requires much consideration and the special attention of those who direct the education of their children. The large number of industrial establishments hitherto entirely under the control of individuals, but which have recently been formed into Joint Stock Companies, with limited liability, will I hope be the means of gradually preventing the recurrence of those differences between the employers and the employed, which have been prolific in causing mischievous combinations of workmen, and led them to follow the dictum of self-constituted committees, whose object appears to be the attainment of irresponsible authority over their fellow-workmen, rather than the real and permanent welfare of the class to which they pretend to belong. Hitherto the workmen have seen their employers accumulate vast capital, increase and extend their works, and live in almost princely style, upon profits derived in a great degree from their constant toil, and the intelligent exercise of their labour, whilst their own position, from the day they commenced life to their maturer years, has scarcely been improved. They still live in the same ill-ventilated, incommodeous, ill-drained houses, in which it is almost impossible for them to maintain their families in health or decency; and perhaps, with the exception of obtaining better education for their children than they could get themselves when children, they are relatively in a worse social condition than their fathers were before them. Such facts, apparent to all, afford to the demagogue ample means and opportunity of exciting feelings of jealousy and distrust between workmen and their employers. Rightly or wrongly they look at the one practical result, that the employers of labour year by year improve their social condition, whilst they see no prospect whatever of any similar advantage being enjoyed by themselves. Under the law of 1862, the great manufacturing and trading companies recently organized must prepare properly authenticated balance-sheets, and thereby enable the workmen to know the exact result of their labour to their employers. Should these results be highly remunerative, and large profits be realized by the union of the capital and intelligence of the master and the skilled labour of the men employed, it will, I think, be difficult for the directors of such companies to avoid considering in what manner they can distribute amongst all connected with such establishments some proportion of the profits obtained. At all events it will afford fair ground and ample

knowledge upon which the workmen can press their claims before the directors, who, if they cannot meet them by reason and sound argument, will subject themselves to an amount of disaffection among their men which must ultimately end in the workmen endeavouring to enforce their reasonable requests by declining to work for such employers.

With a view to improve the Art education of working men and to encourage them in the course of self-improvement, the Council last year offered prizes for works of art executed by working men in their leisure time, from drawings and models furnished by the Society. The number of competitors for these prizes was 70, and it was to those who obtained, by the excellency of their work, the rewards offered by the Society, that His Royal Highness the Prince of Wales distributed the prizes at the annual meeting. The success of this attempt to encourage the cultivation of taste and skill was so satisfactory that the Society has published a much more extensive list of prizes, mostly of a higher character than those offered in 1863, to be competed for this year. The Council cannot but believe that the interest they have shown in everything relating to art workmanship has been very instrumental in originating the exhibitions supported by working men themselves which have recently taken place. The first, held in Lambeth, has been followed by one on a much larger scale in the North of London, and each of these exhibitions has in various ways received the support of your Society.

The Council wish, however, to suggest to the great Companies of this City, as well as of the municipal bodies in the country, the great benefits which must follow their occasionally combining to exhibit to the working classes the precious specimens of High Art Workmanship which many of them possess. To a workman, the knowledge that a particular work of Art can be produced, especially if he can see and examine it, is sufficient to stimulate him to attempt a work of Art of equal merit, and perhaps to excel it.

The Executive Committee of the Dublin International Exhibition, to be held next year, have formed a Committee of Advice, consisting of members of this Society and others, which is to meet in London, and the Council have given their consent to the meetings of the Committee being held in this house, hoping thereby to contribute to the success of the exhibition. At the same time, the Council have expressly stated to the Executive Committee that this Society would not incur any pecuniary responsibility in connection with such Exhibition.

Since we last met it is generally understood that the Royal Commission appointed to con-

sider the operation of the Patent Laws has made its report, but their report, although copies have been obtained by a few individuals, has not yet been issued to the public. I do not think it necessary, under these circumstances, to refer to the subject further, as no doubt, during the coming Session, when the report is published, it will be brought under the consideration of the Society at one of our weekly meetings.

The success of the Cantor Lectures last year has encouraged the Council to provide another series of three courses of lectures, to be delivered by Dr. F. C. Calvert, "On the Application of Chemistry to the Arts," by Mr. Waterhouse Hawkins; "On the Relation of Science and Art to Manufactures;" and by Professor Ansted, "On the Application of Geology to Arts and Manufactures." Last year, uncertain of what the attendance might be, the Council issued tickets for the admission of two friends by each member; but owing to the number of members who were precluded, by the crowded state of the room, from attending these lectures, the Council, this season, must limit the issue of tickets to one for each member. Programmes of these lectures, and the days on which they will be delivered, will be duly announced in the *Journal*.

Having thus traced the progress of this Society almost since its first establishment, in its endeavours to promote improvements in our Manufactures and the extension of our Commerce, I will now endeavour, in conformity with the bye-law, to place before you the policy the Council intend to pursue during the coming Session. Continuing the measures we have taken to promote the education of Art-Workmen, we hope by extending the sphere of our operations and offering a greater encouragement to compete for the prizes the Society will offer, to produce greater results than have hitherto been attained in that direction. By the continuance of the Cantor Lectures we hope to afford to our members and their friends the means of obtaining the best and latest information on the subjects to which they relate.

The Wednesday evening Meetings will be continued as usual, and the Council hope that the members of the Society will assist them in making them as interesting as possible, by communicating the results of any new discoveries or processes, in papers, to be read at these meetings; and they are glad to announce that the season will be opened by a paper on the "Application of Iron to the purposes of War and Naval Construction," by Wm. Fairbairn, Esq., LL.D., F.R.S.

It will interest the members to hear that Mr. F. A. Paget, who read a paper in May last on "The Testing of Chain Cables," has, in consequence of the knowledge he displayed in that

paper, been requested, by the Board of Trade, in conjunction with Sir Wm. Armstrong, Mr. Wm. Fairbairn, Mr John Hicks, Mr. J. Nasmyth, and Mr. J. Penn, to report on the rules and regulations to be adopted by the Government in reference to the manner in which the testing operations, as directed by Mr. Laird's Act last session, shall be conducted.

Through the inquiries of the Committee appointed to consider how the difficulties which now appear to retard the provision of proper dwellings for the working classes may be overcome, we trust we shall be able to suggest measures by which this great plague-spot in the social condition of the mass of the people of this country may be materially mitigated if not removed. No subject can be more worthy the attention of the Society.

And continuing to investigate the causes of strikes, in connection with the altered state of the law of partnership, the Council hope still further to promote the harmonious working of that vast power which is wielded by the industrious classes of the kingdom, and which, if directed by sound principles, must tend very much to promote the prosperity of the manufacturers of this country.

It is specially a duty of this Society to persevere in this inquiry, now that some persons are doubtful as to the beneficial results of education amongst the working classes, attributing to it the greater power of mischievous combination, instead of considering in what respect the present education is imperfect, and the means whereby it may be more strictly adapted to the wants and special necessities of the industrial classes.

It is not customary I believe in these addresses to allude to public works, but those now in progress are of so much importance, and calculated in so high a degree to promote the objects the Society has in view, that I cannot avoid referring to them. The system of main-drainage, being carried out under the superintendence and according to the plans of Mr. Bazalgette, is a work worthy of the greatest city in the world, and no one can doubt that it will materially improve the sanitary condition of this metropolis; but, perfect as this system appears to be, it will be deficient in one great element of success if the refuse matter conveyed through its channels be not turned to some useful and profitable account. I hope we may have papers read at our evening meetings on this interesting and important subject, for it is one which ought to engage the attention of the mechanical engineer, the practical manufacturing chemist, and the agriculturist. And alluding to the drainage of London leads me to say a few words on the drainage and water supply of country towns and rural districts.

In a sanitary point of view this is of equal importance to the drainage of London; for, although there are not the same number of people crowded on a given surface, the want of proper drainage contaminates the water usually drawn from shallow wells, and produces most serious effects upon the health of the people.

The second public work to which I will refer, the Thames embankment, though of a totally different character, will produce results of almost equal utility and advantage, but this work differs in one respect from the main-drainage works, inasmuch as it will afford opportunities for the introduction of taste and ornament in its design, and will form one of the greatest attractions of this metropolis. The Thames embankment must be considered as the first great public work undertaken with a view as well to the embellishment, as for the improvement in the communication between distant parts, of this great city. It is rare, indeed, that it devolves upon one man to execute two such works, and to distinguish himself by the skill with which he has overcome the difficulties incidental to carrying out the system of drainage of a large city, and to exhibit so much taste and constructive skill as he has displayed in his designs for the embankment. Both of these works deserve the special notice of our Society during their progress toward completion, and I hope we shall find members willing to bring them before us, and to do justice to their respective merits.

Our underground railways, although conducted by public companies for individual advantage, may, from their great extent and importance, be considered as public works. I am more particularly induced to notice them, as they appear to be defective in one or two respects, which will offer good subjects for papers to be read at our meetings. The motive-power now used, and the ventilation required to remove the products of combustion incidental to the use of this motive-power, afford a fine field for the display of the ingenuity of the mechanical engineer. Perhaps it may be bold to recommend the introduction of the atmospheric system, which is associated in the public mind with most expensive failures, though on consideration it will perhaps be found that the causes which produced these failures do not exist in an underground railway. It was generally understood to be impossible to make a luting which would be equally effective in maintaining the partial vacuum required in the hottest day of summer and the coldest day in winter, involving as it does a variation of  $60^{\circ}$  to  $80^{\circ}$  of temperature often within a few hours; but in the underground railways, the temperature in summer and winter varies but little—certainly not sufficiently to destroy the efficiency of a carefully-prepared luting. We hope that this sub-

ject will meet with the attention it deserves, for if found to be practicable, it would materially add to the comfort of travellers by this novel, and, in many respects, most advantageous mode of conveyance.

In concluding this address I must express the gratification of the Council, which will, I am sure, be shared by the members present, at the very eulogistic manner in which the exertions of the Society, in promoting education among the members of Mechanics' Institutes and other kindred bodies, by means of competitive Examinations, have been noticed by distinguished members of Parliament and others, when speaking during the last few months upon the various modes by which a good education can now be obtained by almost every class of society. There appears every reason to believe that the Certificates granted by our Examiners are highly valued, and assist those who attain them in their advancement in life. We have also every reason to be satisfied with the annual increase in the number of papers submitted to the Examiners, and with the steady improvement in the degree of information exhibited in the papers prepared by the competitors for prizes.

I hope it may not here be out of place to refer to the want of public recognition which exists in this country for the highest class of intelligence, when devoted to the improvement of the Arts and the extension of our Manufactures and Commerce. Recently, no doubt, the Government has conferred honours on a few distinguished merchants and manufacturers, but such honours, having had in almost every case something of a political character, have been deprived of their value as a public testimony to services rendered through a long series of years in aiding to build up that great fabric of Commerce and Manufactures of which we are so justly proud, and upon the maintenance of which, in all parts of the world and among all nations, our national power and influence so much depends.

I am happy to congratulate the members on the continued prosperity of the Society, our numbers being larger than at the opening of any previous session; and the interest taken in the papers read at our evening meetings, shown by the numbers regularly attending them, proves that the policy hitherto pursued by your Council has been approved by the Society.

I trust that the statements I have been able to make this evening justify a confident anticipation of an equally successful progress during the session I have now the satisfaction to open.

After the delivery of this Address,

Vice-Chancellor Sir W. PAGE WOOD said he desired to submit to the meeting a resolution, which he was confident

would be received with acclamation, viz., a vote of thanks to the chairman for the very admirable address he had delivered. They had been accustomed to hear very able addresses from that chair. He would not make comparisons, but he would venture to say they had heard none more able than that with which they had been favoured that evening; and especially gratifying must the last announcement be, that the number of members of the Society was larger than at the opening of any former session; and when they looked back on the various subjects which had occupied the attention of the Society, as detailed in the address, the cause of this continued increase in the members was apparent. The Society had taken a great start from the period when it had adopted broader views in the promotion of Arts, Manufactures, and Commerce. The Society's rewards were bestowed with great care, and awarded to those who had done great services in promoting industrial progress and the welfare of mankind. When they saw that men of such eminence as Sir Rowland Hill and Dr. Maine felt themselves honoured in receiving the prizes of this Society, it was an evidence that it had risen in estimation, and was fully carrying out the important objects for which it was instituted. He considered this Society filled, with respect to Arts, Manufactures, and Commerce, the position which was occupied in commerce by the broker or agent. The broker ascertained and supplied the wants and needs of different classes of the community, and in like manner this Society received and diffused information for the benefit of those engaged in the several branches of science and industry to which its attention was directed. Such had always been the function of the Society, and it had of late years greatly increased its usefulness by adopting two special modes, which, though apparently different, were in reality based upon the same principle, the one stimulating the talent and skill of the younger branches of the community, and the other that of those more advanced in life and position. The examinations established by the Society accomplished the one; and on the other hand exhibitions might be regarded as competitive examinations for those engaged in industrial pursuits, in which men produced the best examples of their skill and placed them in competition with the whole manufactures of the world. Such was, he apprehended, the position which this Society was now taking; and how large were the sympathies of the Society in this matter had been admirably shown by the varied characters and position of the members whose deaths had been noticed by the chairman. They found mention of one man distinguished in the fine arts as a painter; they had lost another member noted in the walks of literature; and others in the mechanical art. The whole list of the Society, indeed, showed how men, distinguished in various walks of life, each devoted to his own pursuit, yet worked together, exercising the powers with which they had been gifted by their Maker for promoting the social happiness, the social comfort, and the social advancement of their fellow-men. He trusted that the very able remarks of the chairman with reference to the dwellings of the working classes would not be lost upon any present. This was a subject worthy of the utmost consideration in connection with a class of the community to whom they were so much indebted—men upon whose labour, and industry, integrity, sobriety, and morality, depended the whole constitution and fabric of the state; for he did not hesitate to say, if they had a corrupted working class, there could never be a great country or a great nation. It was a source of satisfaction to know that they had a working class which he might say, with some knowledge of the workmen of other countries, stood in a high and distinguished position with reference not only to industry—for that was known to the whole world—but in morality and integrity. Where there were defects, they might be traced to the miserable condition of the habitations in which so many were compelled to live. The railways, whilst

they had driven vast multitudes of the working classes from their former habitations, promised to do much in the way of remedying this evil. They had heard on former occasions of plans devised, not only from motives of benevolence, but upon the soundest principles of political economy, for conveying the working classes at cheap rates, not only from one part of the metropolis to another, but to localities where suitable habitations were provided at rents within their means. The chairman that evening had made reference to other plans, into the details of which it was not his province to enter. The chairman had stated, to his (Sir W. P. Wood's) surprise, that some copies of the Report of the Commission appointed to consider the working of the Patent Laws had got abroad. Now, as he happened to be one of the commissioners, and as he had not yet signed the report, he was at a loss to understand how any copies of it had got abroad. It was no doubt a subject of great importance to all interested in it, but he might say, as had already been stated by the chairman of that commission (Lord Stanley), that he was afraid it might much disappoint those who expected great results from it. He drew attention to the several topics in the Address, because he felt that, to the wide range of subjects which occupied their attention, was mainly due its increasing numbers and its means of usefulness; and while the Society continued to be guided by the principles on which it had been governed for several years past, and for the introduction of which, it must be recollect, they were largely indebted to the personal interest of the late Prince Consort, future chairmen would report its continued prosperity. He begged, in conclusion, to ask the members of the Society to tender to the chairman their best thanks for the able address he had given them.

Mr. JOHN DILLON seconded the motion.

Mr. HARTLEY, as a manufacturer and large employer of labour, called attention to the great scarcity of skilled labour in this country, which he said was the case to such an extent that a very large amount of skilled workmanship had to be sent abroad to be executed. This was a subject which he hoped would be taken up by the Society. There were abundant means of supplying the requisite amount of skilled labour which an increasing trade demanded; and the advantage to a boy being properly educated as a skilled workman was equal to giving him £600.

Mr. P. PALMER expressed a hope that the influence of the Society and of the Chairman, as a member of one of the principal City companies, would be exerted to induce those corporations to exhibit the rich treasures of works of art which they possessed for the benefit of the community. He thought it would well comport with the position and dignity of the great City companies to co-operate with the Society in the way he suggested in aiding the spread of the art education of the country.

Mr. HARRY CHESTER might so far answer, on behalf of the Council, the observations just made by stating that the question of skilled labour was one which had largely engaged the attention of that body. They were aware of the great want that existed. They were not, however, at present prepared with any particular plan from which they hoped to derive any great results in that direction; but it was a subject which in various forms had been always more or less before them. The exhibitions which had been suggested by the last speaker might have a tendency in that direction, and it would be most gratifying to the Council to give their aid to any scheme which promised to be instrumental in carrying out the extension of their object.

The resolution having been put was carried by acclamation.

The CHAIRMAN acknowledged the high compliment which had been paid him.

The SECRETARY called attention to some very fine

photographic enlargements from small negatives, executed by means of Dr. Van Monkhoven's improved solar camera, and lent by Mr. J. H. Dalmeyer.

## Proceedings of Institutions.

**FARNHAM YOUNG MEN'S ASSOCIATION.**—On Friday evening, November 4th, the lecture session of 1864-5 was opened with the delivery of a lecture, by the Rev. J. McConnel Hussey, of Brixton, on "Home." The Bishop of Winchester, president of the association, occupied the chair, and in introducing the lecturer congratulated the members on the advancing prosperity of the association, and gave particulars in reference to the past lecture session, the working of the library, and reading room.

**LONDON MECHANICS' INSTITUTION.**—On Friday evening, the 4th of November, a distribution of the prizes and certificates obtained by the members of the Institution at the last Examination of the Society of Arts; also at the Examination of the Metropolitan Association for Promoting the Education of Adults; and also the prizes offered to the classes by the Local Board of the Institution, took place at the London Mechanics' Institution, Southampton-buildings, Chancery-lane. The prizes consisted of standard popular works, in handsome bindings. Mr. HARRY CHESTER presided, and the Honorary Secretary of the Local Board of Examiners stated that the candidates examined this year, while obtaining a fair share of honour for themselves, had not failed to maintain the reputation of the Institution. Eighteen candidates presented themselves to the Board for the Preliminary Examination required by the Society of Arts, of whom sixteen were passed for the Final Examination by the Society's own Examiners. Of these, fourteen attended, and obtained between them (none having been rejected) twenty-seven certificates—nine first-class, fifteen second, and three third—with the first and second prizes in logic, the second prize in English history, and the third in English literature. A number of the junior and less advanced members of the Institution had availed themselves of the Examinations of the Metropolitan Association for Promoting the Education of Adults, which, like those of the Society of Arts, were conducted by the Local Board, but were of a more elementary character. The candidates obtained a fair proportion of certificates, and several of the principal prizes offered by the Association. A Competitive Examination of the classes of the Institution had been held by the Local Board, and book prizes awarded to the successful candidates. Mr. Reed appealed to the members for donations to the prize fund, in the shape of books or money, and as an instance of the successful working of the Board, stated that during the past five years only one candidate passed by them for the Examination of the Society of Arts had been rejected. The Chairman, with a brief explanation of the nature and working of the Examinations, proceeded to distribute the certificates and prizes, at the same time announcing that Her Royal Highness the Princess of Wales had given a prize of a Bible, value three guineas, to be contended for in needlework by young women. Her Royal Highness's name would be written by her own hand in the Bible. The prizes having been distributed, the chairman, in closing the proceedings, congratulated the meeting on the great success of this, the oldest of the Mechanics' Institutes. The City of London College, which was a much larger Institution, sent up a greater number of candidates, but for its size none had been more successful than the London Mechanics' Institution, nor had entered more heartily into the views of the Society of Arts. They had opened three classes to women, which he thought a great advantage. He did not approve of opening the Universities to females, but hoped that before long a suitable scheme would be

matured for the furtherance of female education. The proceedings terminated with a cordial vote of thanks to the chairman.

**MARLBOROUGH READING AND MUTUAL IMPROVEMENT SOCIETY.**—The twentieth annual report of the Society states that further accommodation has been made to the library, giving increased facilities in the selection of books. The Corn Exchange Committee have lent the Exchange for the opening and other lectures of the present season. In order to make the building available for lectures, an outlay of about £5 was absolutely necessary, and a further similar sum will be required if the building is continued to be used for all or the more popular of the Society's lectures.

## THE CONDITION OF MINES IN GREAT BRITAIN.

The report of the commissioners\* appointed by her Majesty to inquire into the condition of all mines in Great Britain to which the provisions of the Act 23 and 24 Vic., cap. 151, do not apply, with reference to the health and safety of persons employed in such mines, has just been issued. The report occupies upwards of forty pages of a small blue book.

From a careful consideration of the evidence they have heard, and of the reports and documents prepared in the course of the inquiry, and from the knowledge acquired by visiting the districts and by inspecting mines therein, the commissioners have agreed to the following resolutions:—

"1. That there is a great excess of sickness and mortality among metalliferous miners, which is mainly attributable to the imperfect ventilation of the mines. However diverse the opinions of medical men may be as to the causes of the disease called 'miner's asthma' or 'miner's consumption,' there is a remarkable concurrence among all the writers on the subject in this, that the health of the miner is greatly influenced by the quality of the air in which he works. The more extended inquiry instituted by us under the royal commission gives strength, if not certainty, to this conclusion. In the coal districts, where, on account of the dangerous gases, great attention has been given to the proper ventilation of the mines, the mortality (accidents excepted) among the miners is considerably less than it is in the metalliferous districts. We have on this account thought it advisable to make ourselves acquainted with the systems of ventilation usually adopted in coal mines, in the hopes that we might thereby be able to offer some suggestions for improving the ventilation in the metalliferous mines. The main object to be kept in view in ventilating a mine is to conduct a sufficient supply of pure air through the mine in order to displace the vitiated air where the men are at work. Various contrivances have been put in practice for effecting this, but they are all applications of two principles, propulsion and extraction; by the first pure air is forced in, by the second foul air is drawn out. The power used may be either natural or artificial. Natural force acts when columns of air are, in the absence of any artificial means, of unequal weight, in which case the heavier column displaces the lighter, and so causes movement and change of air. Another natural force acts when the wind blows in at a level or over a shaft. Artificial propulsion is effected by various applications of machinery and other contrivances, such as falling water, the water blast, or the fan; artificial extraction, by suction or by furnace heating. The most simple method of ventilation is by natural agencies directed and supplemented by engineering skill. Two or more shafts or adits are essential, so contrived that one shall be upcast in all states of the

\* The Commissioners were—Lord Kinnaird, Sir P. M. Grey Egerton, Nicholas Kendal, F. Leveson Gower, John St. Aubyn, R. Davey, E. Headlam Greenhow, and P. H. Holland, with J. F. Campbell, Secretary.

weather. A system of trunk ventilation being thus established the pure air may be guided to any part of the mine where it may be required, if care be taken to remove all refuse or 'deads,' and to close up all old and abandoned workings, by which the currents of air may be interfered with. In cases where natural ventilation is insufficient, artificial means must be resorted to, and of these it appears to us by far the most effectual, where it can be adopted, is that which is generally in use in the coal mines, namely, the rarification of the air in one of the shafts by the heat of a furnace. The mechanical means which have been suggested are the introduction of pure air by a force pump, and the abstraction of foul air by a suction pump. Machines for the latter purpose are in successful operation in some collieries and mines in this country. The foregoing remarks chiefly apply to the maintenance of a regular system of trunk ventilation. In small mines, and in certain parts of large mines, a good supply of air may be provided by means of contrivances which cannot be economically applied on a large scale, such as different descriptions of air pumps, water blasts, and fans. These may answer the purpose when judiciously applied and carefully attended to. It appears to us worthy of consideration whether some combination of natural with artificial appliances might not be adopted at a comparatively small expense, considering the benefit that would thence accrue both to the employer and employed. Cases have come before us of mines in which, in certain conditions of the atmosphere, the circulation of air underground is regular and sufficient, while at other times it varies both in quantity and direction, consequent upon the inversion or stagnation of the current of air in the shaft. This evil might be effectually conquered by the maintenance of a constant upcast shaft, and, where natural causes fail, this might be effected by an application of furnace heating. Whatever system, however, may hereafter be adopted, it is essentially necessary that attention should be paid to driving the levels of sufficient size, to making more frequent communications between them, to removing the refuse, closing up disused winzes, sumps, shafts, and abandoned workings, and to the judicious application of air-tight doors and brattices so as to control the direction of the underground currents.

"2. That several other causes, both general and local, largely contribute to impair the health of the miner—namely, exposure to cold and wet, and to sudden alternations of temperature; wearing wet clothes, inhalation of gritty particles; and the exertion of climbing ladders from great depths.—Amongst the causes enumerated by the medical men as tending to impair the health of the miner, exposure to sudden alternations of temperature to wet and cold is much insisted upon. The miner is peculiarly liable to these dangers, either from imprudence on his own part or from want of proper arrangements on the part of his employers. Another cause most injurious to the health of the miners is the exertion of climbing ladders continuously from great depths. The evidence of the medical witnesses and of the miners themselves leaves no doubts on our minds as to the pernicious effects of severe climbing upon men whose constitutions are, perhaps, impaired by the conditions under which they work, and the severity of the work itself. This evil is occasionally enhanced by the impure state of the air in the ladder ways, and aggravated by the indiscretion of the miners themselves, especially the younger ones, in mounting the ladders with too much haste. In those mines where the man engine has been in operation the improvement in the health of the miners is stated to be evident. In most coal mines workmen are conveyed up and down the shaft in the 'cages.' This arrangement appears to us to be expeditious and safe, when due attention is paid to the construction and supervision of the machinery; and we think it might be advantageously introduced in many of the metalliferous mines. We therefore recommend—1. That every mine should be

provided with proper houses conveniently situated, in which the men can change and dry their clothes. 2. That surface work should, as far as practicable, be carried on under shelter, and that suitable places should be provided in which women and children employed at the mines might take their meals. 3. That in order to avoid the evils consequent on climbing ladders, mechanical means should be provided to convey the men to and from the surface when the mines are of great depth.

"3. That accidents are of frequent occurrence in metalliferous mines, and that they principally result from miners falling from ladders and stemples, or from one level to another; from falls of the rock or stuff; from want of caution in blasting; from defective gear and imperfect supervision of machinery; from sudden irruptions of water or foul air, and from the bursting of boilers.—To obviate as far as possible the various accidents to which miners are exposed, we recommend,—1. That no ladderway should be allowed in a drawing shaft without the shaft being properly divided or bratticed off from the footway, and that efficient sollars should be fixed at moderate distances in all footways, whether the ascent or descent be by ladders or stemples. 2. That shafts, winzes, sumps, and shoots should be more carefully guarded. 3. That more stringent rules should be enforced in regard to blasting, with a view to preventing accidents, and that bronze tamping rods and prickers should be supplied to the men. 4. That the persons having charge of the footways and other works underground should daily enter in a book a report of their condition to the agent or captain of the mine, which should be produced in case of inquiry. 5. That the boilers and other machinery should be periodically examined by the mine engineer, and that a monthly report thereon should be given in to the captain or agent, to be produced by him should occasion require. 6. That the men should not be allowed to change in the boiler house, which none but those in charge should be permitted to enter. 7. That all boilers should be provided with two safety valves and a water guage or a steam whistle. 8. That plans and working sections of all mines on their being abandoned should be deposited at the office of the clerk of the peace for the county, and at the Government Mining Record Office in Jermyn-street, for reference in case of working being resumed, or new mines opened up in the immediate vicinity.

"4. That abandoned shafts, and old works unprotected at the surface, are a cause of serious danger, not only to the miner, but to the public.—The accidents consequent upon the practice of leaving abandoned shafts and works insufficiently guarded or wholly unprotected, are so numerous that we think it very desirable that an efficient and easily available legal remedy should be provided in order to guard the public from this prolific source of danger.

"5. That the employment of boys underground at an early age contributes to produce disease and premature death.—We therefore think it desirable that, as a general rule, no boys under the age of fourteen years should work below the surface.

"6. The system of mine clubs as at present in general operation is unsatisfactory, as not providing for cases of sickness as well as of accident.—We therefore suggest the adoption of such a system of mine clubs as would afford the men sufficient maintenance during sickness as well as while suffering from the effects of accident."

## Manufactures.

**SILK MANUFACTURES OF SWITZERLAND.**—The export of silk goods in 1862 was 35,412 cwt., which was much more than any preceding year, than even 1859, which was considered a very favourable one. Most of the coloured silk stuffs are made, Esle being chiefly celebrated for its ribbons. The newly-invented aniline dyes are rapidly taking the place of the figured silk dr. ribbons. Some

idea of the work done at the dyeing establishments can be formed, when it is stated that one, Mr. Clavil, of Bâle, turns out 90 cwt. of dyed silk per week, and pays away in expenses about £20,000 a-year. There are thirty-one ribbon manufactorys at Bâle, and two for stuffs. By far the largest number of weavers are employed in their own houses. The proportion of looms is about 1,500 in factories and 6,000 dispersed in different parts of the country. The silk industry of Bâle may be considered as a vital occupation for the town. On this more than 10,000 persons, or a fourth part of the town population, subsist.

**PAPER IN DENMARK** is for the most part of very inferior quality; protected under the old tariff by a high import duty upon foreign manufacture, and an equally high export duty on rags. This manufacture is represented by 18 mills, only six of which are of any importance.

**PREPARED OF FLAX.**—A French manufacturer, named Bertin, has invented what is reported to be a successful method of dispensing with the steeping of flax. After the fibres have been crushed in the ordinary way, M. Bertin submits them to a new process, that of friction between two channelled tables, which have a sideway as well as to-and-fro motion; in fact, the action is similar to that of rubbing the fibres between the palms of the hands, but under considerable pressure and with great rapidity. The fibre is afterwards beaten in water, which carries off every particle of woody matter and leaves the flax completely unbroken and in parallel masses. The principle of friction tables has been applied by M. Bertin in other cases, and is said to furnish an economical, rapid, and perfect mechanical action. The same gentleman has adopted a new system of chemical steeping to get rid of the resinous and other matter which attaches the fibres together, which is said to produce the required effect in less than two hours, at a cost of about 1s. 8d. per cwt., leaving the flax nearly white; but the particulars are not given. By M. Bertin's system it is affirmed that the yield of flax is raised from 12 or 15 to 20 or 22 per cent. of the gross material. Lastly, M. Bertin collects the refuse beneath his crushing machines, burns it in his boiler furnaces, and uses the ashes and the water in which the flax is steeped as manure, giving back, as he affirms, the whole of the mineral salts and azotised matter contained in the crop, and the cost of so much artificial manure saved to the cultivator.

**DIS FIBRE.**—The Jury of the Exhibition of 1862 awarded a medal to M. Lafon de Caudaval for his specimens of paper and yarns prepared from the plant called *Dis* by the Arabs, and by botanists, *Festuca patula*, *Arundo festucoides*, *Arundo mauritanica*, or *tenax*, and its claim to the attention of the commercial world is being prominently put forward in France. It is reported to grow spontaneously on the coast of Algeria, over an extent of 250 leagues, and is said to yield 84 per cent. of fibre, 6½ per cent. of gluten for use as tapioca, and 9½ per cent. of water and herbaceous elements. The fibre is applicable to the making of paper, coarse fabrics, and cordage, and is not subject to the attacks of insects. For paper making it is treated in the same manner as rags. For the extraction of the gluten the crushed plant is steeped for three or four days in lime water, and afterwards for the same period in an acidulated solution; this disengages carbonic acid gas, which, in escaping, exercises, apparently, a kind of mechanical action in completing the separation of the fibres, and these are afterwards beaten in water by machinery. The average length of the Dis fibre is given at nearly five feet, and the cost of the prepared flax at about 4s. 6d. per cwt.

### Commerce.

**PIRACY OF TRADE MARKS.**—A deputation from the committee of the Association of Chambers of Commerce,

joined by delegates from the Birmingham, Sheffield, and Wolverhampton Chambers, had an interview on Friday, the 11th instant, with Mr. Layard, Under-Secretary of State for Foreign Affairs, in order to impress upon her Majesty's Government the injury to be apprehended from the provisions in reference to trade marks contained in the Franco-Prussian and Anglo-Prussian treaties of commerce. The deputation consisted of Mr. Sampson S. Lloyd, of Birmingham, chairman of the Association of Chambers of Commerce; Mr. Atkinson, Master Cutler, of Sheffield; Mr. Robert Jackson, president, and Mr. W. Smith, secretary of the Sheffield Chamber of Commerce; Mr. H. W. Ripley, president of the Bradford Chamber of Commerce; Mr. Robt. Fletcher, Mr. Yates, and Mr. Bartleet (Redditch), of the Birmingham Chamber; and Mr. Loveridge and Mr. E. J. Gibbs, of the Wolverhampton Chamber. The deputation pointed out in detail the dangerous effect of the second portion of the 28th article of the Franco-Prussian treaty, which legalises for ever the piracy of all trade-marks whose origin is anterior to their registration in the country of importation, whose registration could not take place until about two years ago. The injurious effect of the clause upon the interests of honest manufacturers in France itself was demonstrated; and the strongest testimony was borne by gentlemen from Sheffield, Birmingham, and Redditch, as to the ruinous results to be apprehended from its operation on the hardware manufactures of this country. Numerous specimens of German forgeries of the marks of eminent British makers, which are publicly sold in large quantities in various continental countries and in America, were shown. The deputation urged upon her Majesty's Government to make use of such facilities as they possess to represent to the French Government the injurious consequences of the clause, in order, if it be not too late, to obtain its modification in the Franco-Prussian treaty. It was also hoped that in any direct negotiation between Great Britain and the Zollverein a clause would be introduced providing for the efficient protection of all British trade marks; and failing that, the opinion was unanimously expressed that the treaty would be more valuable if the second clause of Article 28 were altogether expunged.

**FRENCH IMPORT DUTY ON SILK RIBBONS.**—The Liverpool Chamber of Commerce have received a communication on this subject from the Foreign-office, to the effect that, in virtue of the treaty lately concluded between France and the Swiss Confederation, the French import duty on silk ribbons has been reduced from 8f. to 4f. per kilogramme, a decrease of 50 per cent., the advantages of which will be shared by British industry as soon as the Franco-Swiss convention comes into operation.

**COMMERCE OF JERUSALEM.**—“Jerusalem,” observes the British Consul in his annual report to the Foreign Office, “is the least commercial or industrial city I know. British trade is represented by one English tradesman, who keeps a store for English upholstery, drapery, and fancy goods. The population of the city is computed at 15,000, rather more than half of them Jews, the rest Moslems and Christians. The chief native industry is the manufacture of soap and “Jerusalem ware,” this latter consisting of chaplets, crucifixes, beads, crosses, and the like, made for the most part at Bethlehem, and sold to the pilgrims, who annually flock to the holy city to the number of about 6,000. The population of the entire Sandjak, or province, is estimated at 200,000, of whom 160,000 are Mahomedans. Owing to the absence of good roads and the insecurity arising from the predatory tribes of Bedouins inhabiting the outskirts of the district, but who could easily be kept in check, vast and fertile plains lie waste or are but partially and poorly cultivated; factories are not to be met with, and no mines are worked, though it is believed that sulphur, bitumen, and rock salt abound on the shores of the Dead Sea. The principal, if not the only imports from England are cotton goods, and some colonials, but the former have much diminished since the cotton crisis; it is calculated

that 300 bales of these goods, of the value of £16,000, annually find their way here. The exports are olive oil and grain. Very little is done in cotton culture, what is raised being of inferior quality, and consumed on the spot; but it is believed that in many parts of the country cotton to a large extent might be successfully cultivated, with good seed and proper instruction and implements given to the peasantry. The vegetable produce is barely sufficient for local requirements. Jaffa is the port through which Jerusalem deals with foreign countries. The trade of Jaffa experienced a considerable increase in 1863. The quantity of cotton exported rose from 55,000lbs. in 1862 to nearly ten times the amount in 1863, with a prospect of this being trebled or quadrupled in 1864. This was owing to the interest exercised. The merchants who operated in cotton made a profit of about 25 per cent. There are regular lines of French, Austrian, and Russian steamers, all doing well, and very often large quantities of goods have to be left behind for want of room; but only one English steamer visited Jaffa in 1863. The exports exceeded £200,000; of the imports no statistics are kept. The consul reports a telegraphic line in course of formation by the Government between Beyrouth and Jaffa, thence to be carried on to Alexandria.

## Colonies.

**VICTORIA.**—The Border Customs question has assumed an aspect which promises some trouble to the Governments of Victoria and New South Wales, and some inconvenience to the inhabitants of the Riverine district and the merchants who trade with them. The Murray River Railway will be finished in the course of three or four weeks. Echuca, the township on the Victorian side of the river, will then become the port for the trade of the vast plains which stretch northwards to Cooper's Creek, watered by the Lachlan, the Murrumbidgee, the Warrigo, and other rivers. These plains, however, are within the limits of New South Wales and Queensland, and as the tariff of Victoria is much more liberal than that of New South Wales, the Sydney Government proposes that the Victorian authorities should collect the extra duties on goods sent across the Murray from this colony, handing the amount over to the Treasurer of New South Wales, on payment of a commission for collection. This course the Victorian Government refuses to take, requiring, it is understood, some concessions as to the navigation of the Murray. In the meantime some half-dozen customs' officers have been stationed at points on the northern bank of the river, with instructions to seize all goods coming from Victoria on which the New South Wales tariff charges have not been paid. The question has been embarrassed by the fact that a wrong has been committed on Victoria, when her boundaries were fixed, in some manner never yet satisfactorily explained. When separation was proposed the river Murrumbidgee was named as the northern boundary of this colony. A dispatch from Lord John Russell shows clearly that the Home Office assented to that line; but when separation was accomplished, it was discovered that the southern bank of the Murray had been substituted for the Murrumbidgee. As neither government is likely to give way in this matter, and the protective principles which find favour in Sydney are opposed to the views entertained in this colony, and there is no probability of the tariffs being assimilated, the course which has been taken therefore is likely to lead to smuggling to a large extent, and the creation of a class of borderers who, in this respect at least, may rival those of the Tweed and the Solway. In commercial matters the state of the colony is sound.

**ROYAL SOCIETY OF TASMANIA.**—The monthly meeting of this Society was held at Hobart Town on the 9th August, but the proceedings have only just been published. A number of returns were laid on the table, together with

several presentations. Mr. M. Alport having reported that the salmon and trout in the breeding ponds were proceeding in a perfectly satisfactory manner, read a paper on the food for salmon in the Tasmanian seas and rivers. Mr. Gould exhibited a map, geologically coloured, of a part of the county of Dorset, and gave a brief description of the distribution and extent of the more important formations. He commented on the absence of the carboniferous and the abundance of granite and older palæozoic rocks. In speaking of the expansions of semi-waste low land, bordering on the coast, he referred to a tufaceous limestone which crops out in thin ledges along the same bank which forms part of the tertiary deposits at Table Cape and Macquarie Harbour, and cited them as showing that the recent elevation of the island had been greater upon the northern than upon the southern side. After pointing out the courses of the more important ranges, he gave a short account of the fertile basaltic areas of Scott's country; he also alluded to the efforts that have been made to discover gold at Nine Mile Springs, and the Devil's Den, referring more especially to the latter as exhibiting gullies of some promise, and pointing out that the work hitherto performed had been perfectly insufficient to afford any test as to the existence of gold, only a few men being employed, and the work performed by them having been in part ineffective, from an injudicious selection of the spot tried.

**SOUTH AUSTRALIAN REVENUE.**—The *S. A. Advertiser*, of the 26th of August, 1864, says:—The revenue for the year ending June the 30th, was £693,840; the expenditure £600,666; the colonial bonded debt, £840,000. The imports for the last quarter amounted to £682,762; for consumption in the colony, £610,160; the total exports of south Australian produce for the same quarter, £670,013.

**RE-EVALUATION OF AUSTRALIAN LAND.**—The great question of the day, and one that almost totally excludes all other business, is that of the re-evaluation of the runs, the leases of which expire in 1865. About 200 of these leases will then fall in, and as the valuator has increased the rental of the first eighteen about sevenfold, the squatters have taken alarm. But even this enormous increase will leave the lessees in possession of the finest grass lands of the province at 6d. per annum per acre. By the 10th of September all the runs situated in the northern parts of the province of South Australia, about eighty in number, will be revalued. There has been no such struggle for many years.

**WINE.**—California will make 1,500,000 gallons of wine this year.

**COCHINEAL IN AUSTRALIA.**—At a meeting of the Acclimatisation Society of New South Wales, held in August, 1864, Mr. Moon announced that the cochineal insect had at last reached the colony alive. For many years past he had used every effort towards obtaining this object, but until then without success. He had had the insect sent to him from America, Madeira, and England, but it had in each instance perished before it had arrived. The society is now indebted, for the introduction of this valuable insect into the colony, to Sir George Grey, Governor of New Zealand. The insect feeds upon the *Cactus opuntia*, and, as a matter of course, the cacti without spines, of which there are several species in the colony, are the most useful.

## Obituary.

**HUDSON GURNEY.**—On Wednesday, the 9th of November, died Hudson Gurney, of Keswick, near Norwich. His life was protracted beyond the usual space allotted to man. When he was born, Joseph the Second had not long ascended the Austrian throne, nor had Frederick the Great made that journey into Silesia which brought about his end, and the female Tiberius, Catherine, consoled her-

self for the loss of Lanskoj by her secret marriage with Potemkin, and her selection of the subaltern Yermoloff. Arrived at manhood, Mr. Gurney assumed the position he may be said almost to have inherited, and added to that position by his intellectual qualifications, which gave him the right of association with Byron and Coleridge, Shelley and Keats, Wordsworth and Southey, Scott and Hook. The subject of this notice was born in the year 1785, and, had he lived till January next, he would have reached the great age of 90. He was a ripe scholar, and possibly the best read man in Norfolk. At an early age he obtained a seat in Parliament, and originally sat for the Rape of Bramber, Sussex, and afterwards was M.P. for Newport, in the Isle of Wight. A serious illness brought about a change of ideas, and Mr. Gurney resigned his seat in the House of Commons, and settled down into the quiet charms of domestic life. His income was reputed to be enormous; but enormous as it was, his charities kept ample pace with its receipt. He appeared to live only with the one idea, and that was, the doing good. He was a patron of art and an elegant and accomplished scholar. It is asserted, and it is believed with much truth, that he expended upon charity as much as £10,000 per annum. There are many men who possess as great qualities as Mr. Hudson Gurney, many who have performed greater actions; but few like himself, reared in the lap of fortune, have ever so persistently and perseveringly entered into the affairs of the poor, and so instinctively, as it were, identified their interest with his own. For many years he had retired from public life. His habits were somewhat singular, since he sat up writing or reading, it is said, through the entire night, generally retiring to bed at daybreak. It is stated that several valuable works from his pen lie on the bookshelves at Keswick Hall; and it is hoped, now that the author is no more, they will be given to the world. The little that is known of the literary capabilities of Mr. Hudson Gurney shows him a man of great intellect; and his translation of the "Cupid and Psyche" of Apuleius is a sufficient proof of the stuff that was in him.

THE DEATH of Mr. J. R. M'CULLOCH, on the 11th of November, is the loss of a valuable public servant and a distinguished man of letters. He had been for some time past subject to attacks on the chest of a dangerous tendency, and his last seizure a few days since proved fatal. From its commencement he gradually declined in strength, but retained all his faculties till his last moments. Mr. M'Culloch was born in Wigtonshire, on the 1st of March, 1789, and he was, therefore, in his 76th year. His father possessed a small freehold estate in that county, and was of the class of small proprietors in the English border counties denominated "statesmen"—cultivators of their own acres. The son received from his maternal grandfather, a Scotch minister, his early education; that is, he was "grounded" in his mother tongue, with some elementary instruction in the dead languages after the then Scotch fashion. On leaving school Mr. M'Culloch was placed in the office of a writer to the signet, but he did not pursue the profession of the law. He settled in Edinburgh and attended the public classes of the University for two years, but did not graduate or study for any profession. Early in 1817 an accidental communication of Mr. M'Culloch's to the *Scotsman* (then first established) led to his connexion with that journal, and for some time he was the editor. In the following year he commenced a series of contributions to the *Edinburgh Review*, and also gave lectures on political economy. In 1820 Mr. M'Culloch quitted Edinburgh for London, continuing his contributions to the *Scotsman* for some years, but contributing also to other periodical works and giving lectures on political economy. In 1828 he was appointed professor of that science in University College, London; but, the chair being unendowed, the number of students attending his lectures was insufficient for his remuneration, and he resigned the professorship. In 1838

the Government appointed him Controller of the London Stationery-office, at a salary of £1,000 per annum, and he continued the head of this department till his death. When he undertook its administration the Stationery-office was an Augean stable. The long and habitual waste of paper in the consumption of the public offices and in printing was fabulous. Mr. M'Culloch accomplished a large annual saving, far exceeding the cost of the department he presided over. By his stern economy and hatred of "jobs" he of course created enemies; but his judicious savings and integrity were undisputed, and are matters of record in Parliamentary reports and returns. Mr. M'Culloch's more lasting and meritorious reputation, however, was gained by his literary labours. They were the result of forty years of study and experience. Statesmen had attended his lectures in London, and his contributions to periodical works had been various and diffuse. But he now began to realize his acquirements. In 1837 Mr. Charles Knight published, in two 8vo. volumes, his *Statistical Account of the British Empire*. This valuable work was subsequently republished by Messrs. Longman in successive editions much enlarged. The latter publishers brought out his *Dictionary of Commerce and Commercial Navigation*—a standard work annually reprinted and revised. These two works may be considered his staple productions, and they were reprinted in the United States and translated in several European countries. His miscellaneous works were numerous, and all more or less valuable contributions to political and economical science. In 1828 he edited for Messrs. Longman, in four vols. 8vo., the best edition of Smith's *Wealth of Nations*, with a life of the author, an introductory discourse, notes, and supplementary dissertations. In 1853 he published a volume of *Treatises and Essays on Economical Policy*, comprising sketches of Quesnay, Adam Smith, and Ricardo. This work was partly a republication of articles contributed by the author to the *Encyclopædia Britannica*, but all were carefully revised and in part re-written, some essays appearing for the first time. In the same year appeared his volume on the *Principles of Political Economy*, lastly corrected and revised. In 1855 he published his treatise on the *Principles and Practical Influence of Taxation and the Funding System*. In 1858 he also published a valuable work on the "Succession to Property vacant by Death: including inquiries into the influence of primogeniture, entails, and compulsory partition upon the public interests." Mr. M'Culloch collected a library on his own special subjects of great value. It contained not only almost every known English work on political economy and statistics, but every foreign publication on those subjects, and it comprised every pamphlet, known or anonymous. In 1855 he published a bibliographical volume on the literature of political economy, a catalogue of his best books, with historical, critical, and biographical notices; and only two years since he completed and privately printed a more extended and valuable catalogue raisonné. Of the latter volume a very few copies were presented to personal and literary friends. The motto on the title-page of this volume was from Barrow:—"The reading of books, what is it but conversing with the wisest men of all ages and all countries, who thereby communicate to us their most deliberate thoughts, choicest notions, and best inventions, couched in good expression, and digested in exact method?" The genius of Mr. M'Culloch was not inventive. He sifted and re-cast the labours of others. Statistics, rather than the principles of political economy, were his *sûre*; but his works were generally lucid and sound. He occasionally indulged in paradox; but in this error he only followed Malthus, Whately, and Senior. There are unsolved problems in political science; and men of genius in advance of their generation, groping in the dark, must sometimes lose their way. Mr. M'Culloch was an original member of the Political Club, and he assisted Lord Overstone in the publication of his lordship's miscellaneous tracts on political economy. In social life he was hospitable, genial, and warm-hearted, and was

esteemed by a large circle of friends who will deeply lament his loss.

### Notes.

**PRINCE CONSORT MEMORIAL.**—The artists entrusted with the execution of the sculpture of the Prince Consort Memorial in Hyde Park, are the following:—Messrs. Foley, Macdowell, Marshall, Weekes, Bell, Theed, Thornycroft, Lawlor, and Baron Marochetti. The four principal, or lower groups, for the four outer corners of the base of the structure, and representing the four quarters of the globe, are—Europe, by Mr. Macdowell; Asia, by Mr. Foley; Africa, by Mr. Theed; and America, by Mr. Bell. The four upper, or secondary groups, are—Agriculture, by Mr. Marshall; Manufactures, by Mr. Weekes; Commerce, by Mr. Thornycroft; and Mechanics, by Mr. Lawlor. The statue of the Prince is to be executed by Baron Marochetti, and the reliefs by Mr. Philip and Mr. Armstead.—*Athenaeum.*

**ROYAL SOCIETY.**—The Copley, Royal, and Rumford medals have this year been awarded as follows:—Copley Medal: Mr. Charles Darwin, F.R.S., for his important researches in geology, zoology, and botanical physiology. Royal Medals: Mr. Jacob Lockhart Clarke, F.R.S., for his researches on the intimate structure of the spinal cord and brain, and on the development of the spinal cord; Mr. Warren De La Rue, F.R.S., for his observations on the total eclipse of the sun in 1860, and for his improvements in astronomical photography. Rumford Medal: Dr. John Tyndall, F.R.S., for his researches on the absorption and radiation of heat by gases and vapours. It is especially satisfactory to find the work of a philosopher, who, like Darwin, is not only the author of numerous monographs of the most varied as well as the most valuable description, but has revolutionised biology by the introduction of new fundamental conceptions, so early and so fully recognised by the Council of the Royal Society.

**ABYSSINIA.**—M. Lejean, Vice Consul of France at Massaona, has just returned home, having recovered his liberty from the prisons of the Emperor of Abyssinia in September last. It took him five weeks to travel from Gondar to Massaona. M. Lejean gives a sad account of the French expedition under M. Bisson, which has been a total failure, and of which the members are in a state of the utmost misery, and thinking of nothing but how they shall find their way home. On his way home, M. Lejean visited a corner of the Nubian Sondau, governed by a Circassian, Monça Pacha, and afterwards went to Halaï by a new route to the country of Zenadéglé, where he was able to rectify several errors which had crept into the last charts by Petermann. M. Lejean brings back with him some documents said to be of great archaeological interest, concerning Adulis and other points of the Sampar coast. He is said also to have discovered several necropoli, and to have found seven Axoumite medals, which are so rare that there are said only to be five in all the European collections known. They bear the head of the sovereign on one side, and the Cross of Abyssinia on the other. He promises to publish shortly a map of the country of the Bogos, and some ethnographical information. M. Lejean is of opinion that a Greek colony was once established at Adulis and its neighbourhood.

### Correspondence.

**REVISED CODE.**—SIR,—The task of criticising the public acts of a department of the State is one of difficulty and delicacy; and the more so, that we have every reason to believe that the one we criticise is one originating in a kindly desire to promote the great object we in common have at heart, and recommended by those who have given their most earnest attention to the subject.

To such, let us hope, however, that a line of fair and candid reasoning will be acceptable, and that anything that we may say will be fairly weighed and favourably considered. There is, it would appear to me, at the bottom of the whole subject involved in the Government payments in aid of schools, a question of the greatest importance, viz.:—Is it, or is it not, the duty of the State, either directly or indirectly, as a separate question to be afterwards determined, to educate, or provide for the education of its children. The State interferes in much smaller questions than this. It will not let me burn my hay-rick, if I thereby risk the hay-rick of my neighbour. It compels me to pay towards the support of the criminal and the suppression of crime. It compels me to provide medical attendance, and sick and old age allowance, for the pauper, although he may have spent and wasted his property and thrown himself upon my industry. Is not the duty of educating as strong as either of these? Is not prevention, if we look at it in this light only, better than cure? Is the soul or the body the subordinate part of us? If it be the duty of the State to educate, or, at least, to provide education, as I think must be admitted, let us then claim to be exempt from the unjust and unworthy charge that we are grasping at the aid of the State, that we are seeking to rob its coffers, when we, as volunteers whose services it accepts, are doing its work, and when the obligation clearly rests, not with that party which, in a spirit of true love, throws itself into the work, but with that which is benefited by the work and whose duty is all but gratuitously done for it by zealous and willing hands. In approaching, then, the question of the Revised Code, we should bear this position in mind, and look at it in the abstract, not whether the State should provide or supplement education, but whether the plan proposed by the Revised Code is the best for the performance of its duty. It is a very large question. We are living under a constitutional government which, in the eye of the law, recognises no class, but provides for and desires that the talent, of whatever class, however humble, should rise to the surface for the service of the State, and that every facility should be given to it. Again, in the eye of the same just laws, all are equal, and, whether born in a village or a town, we have a right to the same advantages, to the same development of talent. All contribute to the taxes. All have a right to the same advantages. The thoughtful and intelligent observer of our constitution will not question this; the justifier of class legislation or class education only will treat it as theory. We are not born to that class of life in which it has pleased God to place us, or many would be still peasants who are most justly among the highest and most distinguished of the land. Education, aiding their own talent, has raised them. Let us not then repudiate the means which has exalted and distinguished our nation, or kick down the ladder by which the wisest and greatest have risen to eminence. Such is my preface to the question of the Revised Code as an instrument, for as such only can I deal with it, and in doing this I am obliged to contrast it with its predecessor. Both were experiments, tentative experiments, as regards the promotion of education, but not, I am disposed to think, as regards the officers employed. We are trying new kinds of artillery and new armour for ships, but this would hardly justify the withdrawal of the pay of our officers or their dismissal; and I confess that I think that this applies, and with a stringent force, to those whom we have encouraged to devote themselves to a new profession, and promised a fixed and settled payment so long as they continued in that profession. But I pass this by for those to adjust whose duty it is to do so, and on whom the responsibility of carrying out the engagements of the country lies. I refer to it only because I look upon the salary of the certificated master or mistress as an apt and satisfactory means of adjusting the claim to which I have already alluded, viz., that of all classes of the country, whether rural or urban, to the same advantages, and to the same chance of rising to the surface and into

eminence by the cultivation of the talents with which God has endowed them. A poor country parish had a chance, by the choice of a high class of teacher, whose Government payment on his certificate came in aid of the poverty of the place, of securing the teaching which the local resources could not secure. In taking away this resource, or throwing it on the managers—which is the same thing—and reducing all possible payments to a question of head money, the Revised Code comes in aid only of those who ought least to want it, and starves those poor small places which are struggling under a difficulty in which the State denies them any sympathy. While talking, but a short time since, on the working of the Code, and expressing my regret at the reduction of at least one-half of the receipts in rural parishes, I was told that it worked admirably in London, and in the parish in which I then was, in which they had largely increased their receipts. But that parish includes some of the largest and handsomest squares in London, and we may safely put them as 50 houses in each square, in each of which no one could pretend to live under an income of £4,000 or £5,000 a year. Here it works well, and the receipts are largely increased. I will not enter on the question of population as a basis, but simply express my conviction that it is a most fallacious one, and that there is no large population where larger aid cannot be had by a zealous clergyman than in a poor but moderate-sized village. I am quoting the figures of the Archbishop of York, in his admirable address on the subject, when I say that "small populations take little advantage of the Government regulations" and that while of large parishes only 8½ per cent. are without Government aid, of the smaller parishes, under 500 population, 91 per cent. are without this aid, and that while 8,851 parishes are reached, 11,024 are untouched and unsailed. The comparatively few populous parishes are aided, which I have endeavoured to show least require aid, while the smaller and poorer and most numerous parishes, to which the requirements act necessarily as a bar, are left to their own resources. Let me pass on, that I may not occupy too much time, to the question of the standard requirements of the Revised Code. Perhaps, under the old code, elementary mechanical instruction was not sufficiently insisted on. I say perhaps, and speak with some reserve, because it is almost necessary, before we determine this, that we should determine what we mean by education. I must not enter into this, nor take up any defined line of argument, but simply assume that it means the discipline and instruction of the mind through the agency of its perceptions and faculties. I will not for a moment trust myself to believe that there can be understood by any one such an education as will enable an infant of six or a boy of ten years to do his duty in that class of life in which it shall have pleased God to place him. If a labourer, a labourer; if a mechanic, a mechanic; perpetuating, or trying to perpetuate, the very worst evils under which any country can labour, the evils of caste, or class, and degradation. Assuming education to mean discipline and instruction of the mind, there is a mean, it would appear to me, between disregarding the mechanics of education, if I may use the expression, as applied to R. W. A., as was the case when it was said by some that they cared not whether the boy could write or spell well if he could give intelligent answers, and that system which insists primarily and almost wholly on this elementary work, to the exclusion or disregard of the awakening of intelligence. The practical educator knows the variety of taste and character he has to deal with, and that he has not really struck the first note until he has found, in some special taste or inclination, the key-note on which the whole course of education depends. To one child some particular work is specially irksome; to a second, another; while each has a particular taste or inclination which may be profitably cultivated. Now, doubtless, discipline requires that these should be wisely and judiciously dealt with, but the division of labour

also requires a principle to which this country owes so much that they should have fair play. The greatest mathematicians, the greatest classics, the greatest lawyers and statesmen, have not always been the best writers. The men of science or inventive skill have not always been the best arithmeticians. The greatest divines and the most eloquent statesmen have not always been good readers. Indeed, in higher life, all these branches of education on which we almost exclusively insist, are grievously neglected. What, then, is the object of this low standard to which, after so short a trial of the old code, we have reverted? Is it not to lower the standard of education, and, as it were, convulsively to struggle out of a difficulty which we have ourselves created, without considering the effect it must necessarily have upon those anxious to raise the standard of education, and upon those struggling with the difficulties of poverty and the narrow-minded views of certain classes amongst our agricultural population? It may be said, therefore, and I think fairly, that the Revised Code has had an injurious effect upon the cause of education. The old code may have been imperfect; indeed, it was so; and in its provisions preocious and inconsiderate, but still it had a greater effect than that which has succeeded it, in raising the education of the country; and everything teaches us, from the great and Divine Exemplar of our holy faith to the humblest legislator, that if we wish to raise our poor fallen humanity, we must take a high standard, and set it in all its fulness before the world. On another ground, I think that we have fair reason to complain of the Revised Code, viz., that it does not carry out its own principle—the payment by results. If this principle were fairly and fully carried out, it might be the means of helping the poorest schools, where active and intelligent masters and managers cordially co-operating with them, produced the results contemplated by the Code; but a bar is put to this by the Council's requirements, and by that ingenious sophistry which has transferred the engagements and liabilities of the Government to the shoulders of the managers, under the pretence of its being necessary to protect those very claims and rights of the masters which they have created and now disregard. The Archbishop of York, in his address, to which I have already alluded, speaks of there being no reduction in the number of pupil teachers. It may be so, and I cannot dispute the correctness of his Grace's information, but there has hardly been time for this to show itself, and I cannot help fearing that it will show itself not only in the number, but in the inferiority of the class, whenever time has been allowed to develop the consequences of the change. Everything is in the downward scale. The money saved—the teaching lowered with the class and tone and standing of the teachers—and we cannot wonder if the vision of a well-taught, well-instructed people, adapted to an age of machinery and science, pales before the argument of £ s. d., which fulfils, but too often, the adage of being "penny wise and pound foolish." We may squander in the punishment of crime what we might most righteously economise in its prevention, and pay highly for much degradation and depravity, which criminal statistics, unquestionable and uncontroversial, show that we might have saved, by a sound education—not by reading, writing, and arithmetic, the miserable skeleton—the dry bones of education—but by the enlargement of the faculties—the cultivation of taste and the creation of that thirst for knowledge as a resource, which is what the Christian educator will strive to attain.—I am, &c.,

S. B.

STUDY OF GEOMETRY.—SIR,—In reference to Mr. J. Culverhouse's letter contained in the Society's *Journal*, 624, Nov. 4th, 1864, wherein he asks "why Euclid is still retained as a school book on the subject of the science of geometry?" which he considers "is rendered unnecessarily abstruse," and "ill adapted to our youth," and in which remarks I concur, I have only now to observe that a book exists containing all of the most useful theorems (not

"theories") and problems of Euclid, which are rendered so exceedingly simple in the demonstrations thereof, as to almost reach the point aimed at by your correspondent, viz., "the results given simply as observations and rules." The book I allude to is Dr. Hutton's "Course of Mathematics," the 1st vol. of which contains the desiderata in question.—I am, &c., T. S. BURT.

18, Wilton-place, N.W., Nov. 7th, 1864.

### MEETINGS FOR THE ENSUING WEEK.

**MON.** ...R. Asiatic, 3.

R. Inst. of British Architects, 8.

Medical, 8<sup>½</sup>. Mr. A. Balmanno Squire, M.B., "On Diseases of the Skin caused by the Acarus." 2. Mr. Henry Lee, "On different Modes in which Constitutional Syphilis may be communicated."

**TUES.** ...Anthropological, 8.

Ethnological, 8. 1. Captain Burton, "On the Ethnology of Dahome." 2. Mr. T. S. Pridgeaux, "On the Principles of Ethnology."

Civil Engineers, 8. 1. Discussion "On the Decay of Materials in Tropical Climates." 2. Mr. E. H. Clark, "Description of the Great Grimsby Docks, &c."

**WED.** ...Society of Arts, 8. Dr. William Fairbairn, "On the Application of Iron to the Purposes of War and Naval Construction."

Archaeological Assoc., 8<sup>½</sup>. 1. Dr. Brushfield, "On Roman Intaglios found at Petriana, or the Great Wall of Hadrian." 2. Mr. Pettigrew, "On Sepulchral Crosses at Ilkley and in the neighbourhood of Leeds." 3. Mr. Syer Cuming, "On Forged Antiquities in Bronze."

Geological, 8. 1. Sir W. E. Logan, "On the Occurrence of Organic Remains in the Laurentian Rocks of Canada." 2. Dr. J. W. Dawson, "On the Structure of certain Organic Remains from the Laurentian Limestones of Canada."

3. Mr. T. Sterry Hunt, "On the Mineralogy of certain Organic Remains from the Laurentian Limestones of Canada." Communicated by Sir W. E. Logan. 4. Mr. W. Keene, "On the Coal-measures of New South Wales, with Spirifers, *Glossopeltis*, and *Lepidodendron*." Communicated by the Assistant-Secretary.

### Patents.

*From Commissioners of Patents Journal, November 11th.*

#### GRANTS OF PROVISIONAL PROTECTION.

Ammonia, manufacture of—2526—R. A. Brooman.

Anchors, construction of—2604—F. Martin.

Artillery, projectiles for—2622—W. Pitts.

Battens—2630—J. Smith.

Blast furnaces—2639—R. A. Brooman.

Boot and shoe making, manufacture of—2563—J. Brownhill.

Brewing and distilling, apparatus employed therein—3598—W. L. Tizard.

Buttons, &c.—2610—G. Davies.

Capes, &c.—2624—J. Emery.

Carriages, &c., reducing the friction of moving parts of—2562—M. Henry.

Chain cables, working of capstans, &c.—2600—W. H. Harfield.

China, articles of—2524—L. Clauss.

Clay, moulding the same into bricks and tiles—2636—J. Heap and T. Jolley.

Cotton pods, breaking the husks of—2554—E. Tomlinson and J. Jones.

Cotton, spinning and doubling—2508—W. B. Haigh and S. Barlow.

Envelopes—2556—A. D. Dhe.

Fabrics, woven—2496—J. Collinge.

Fire-arms and cartridges—2602—G. Davis.

Gas and atmospheric air, carburation of—2560—J. Cassell.

Houses, chimneys and flues for—2542—W. H. Kelsey.

Indigo, method of obtaining from textile materials—2156—J. F. P. Hugueneng.

Iron, manufacture of—2581—W. Taylor, H. Harrison, and G. Brown.

Jute—2654—R. Hart and J. F. Calder.

Lace, dressing—2345—W. Carter.

Ladies' skirts—2579—J. C. A. Henderson.

Lamps, wick and chimney holders for—1670—B. Whitehouse and C. Priestland.

Looms for weaving—2640—S. Shaw.

Matches, &c., receptacles for—2620—G. Betjemann, G. W. Betjemann, and J. Betjemann.

Metals, cleaning and polishing the surfaces of—2354—G. P. Wheeler and J. F. Glynn.

Metals, pressure to the rolling and drawing of—2520—M. A. F. Mennons.

Moulding and planing wood, machinery for—2608—H. Wilson.

Piles, driving and drawing—2528—J. Robbins.

Postal and other purposes, stamping applicable to—2606—C. H. Gardner and C. English.

Powder magazines for storing, &c.—2628—R. Hookham.

Projectiles—2015—J. H. Huxley.	1217. M. Henry.	1264. J. Combe and J. H. Smallpage.
Propellers—2626—E. E. Colley.	1228. A. Fryer.	1280. C. Minasi.
Pumps—2548—W. E. Newton.	1229. L. Bricout.	1947. F. Thornton.
Railways, signalling on—2638—J. Tate.	1234. W. Reid.	2122. R. W. Thomas.
Railway trains, signalling on—2616—J. Scarisbrick.	1236. W. Wilson.	
Rotary engines—2598—W. E. Newton.		
Screw jacks, &c.—2625—A. Muir.		
Screw presses, &c.—2617—A. Muir.		
Sea wrack grass, treatment of—2522—E. Moride.		
Signals or alarms—2558—T. Corbett.		
Slicer, bean—2530—J. Batkin.		
Smelling bottles—2658—Charles May.		
Steam boiler, consuming smoke in—2632—R. A. Brooman.		
Steam-boilers—2550—F. Wise.		
Stoves, construction of—2534—A. Hippius.		
Sulphuric acids, concentrating and distilling—2634—W. Clark.		
Textile fabrics, composition for waterproofing, &c.—2656—P. A. Le Comte de Fontainemoreau.		
Titanic iron sands—2650—B. F. Brunel.		
Tubes, securing in tube sheets—2170—E. R. Lloyd and S. Lloyd.		
Wax, preparation of artificial—2552—W. Clark.		
Weaving ornamental fabrics—2652—J. Cunningham and R. Cunningham.		
Woven fabrics, manufacture of—2592—W. H. Ablett and J. B. Baines.		
INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.		
Corks, &c.—2716—W. Davies, G. Cate, and W. Cate.		
Rivets, fastening of—2746—G. Haseltine.		
PATENTS SEALED.		
	1217. M. Henry.	1304. H. Wimshurst.
	1228. A. Fryer.	1318. G. T. Bousfield.
	1229. L. Bricout.	1325. J. W. Lees.
	1234. W. Reid.	1349. J. Young.
	1236. W. Wilson.	1364. J. Sykes.
		1366. O. E. Priefer.
		1412. H. A. Bonneville.
		1506. P. Spence & H. D. Pochin.
		1509. J. H. Johnson.
		1519. J. H. Johnson.
		1573. W. Clark.
		1596. H. Chamberlain, J. Craven, and H. Wedekind.
		1944. A. Long.
		2252. A. V. Newton.
		2262. S. A. Baron.
		2263. S. A. Baron.

*From Commissioners of Patents Journal, November 15th.*

#### PATENTS SEALED.

1243. R. A. Brooman.	1304. H. Wimshurst.
1244. G. Hunter.	1318. G. T. Bousfield.
1245. W. Rowan.	1325. J. W. Lees.
1247. P. Baden, and J. and S. Williams.	1349. J. Young.
1249. H. A. C. Boulenger.	1364. J. Sykes.
1254. J. B. Merrikin.	1366. O. E. Priefer.
1259. J. Browning.	1412. H. A. Bonneville.
1262. Z. Dunlevie and J. Jones.	1506. P. Spence & H. D. Pochin.
1263. W. Bauer.	1509. J. H. Johnson.
1267. W. R. Harris.	1519. J. H. Johnson.
1269. J. Frazier.	1573. W. Clark.
1272. E. Wilson.	1596. H. Chamberlain, J. Craven, and H. Wedekind.
1274. E. A. Cowper.	1944. A. Long.
1275. S. R. Dickson.	2252. A. V. Newton.
1279. J. Belham & G. Valentine.	2262. S. A. Baron.
1291. M. P. W. Boulton.	2263. S. A. Baron.

#### PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2809. J. Byrne.	2834. W. J. Hay.
2821. E. Loyset.	2883. J. C. Goodall and J. Beale.
2826. W. Tongue.	2854. T. Proctor.
2827. D. Y. Stewart.	2877. E. Loomes.
2833. C. O. Crosby.	2878. W. E. Newton.

#### PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

2842. J. Harrington.	2909. J. Clarke.
2843. H. C. Bartlett.	

### Registered Designs.

Ladies' Safety Pocket—Sept. 30—4661—Alfred Chas. Hawes, 35, Dame-street, Fackington-street, Islington.
A Purse—Oct. 5—4662—C. G. Arnold and Co., Leipzig, Germany.
Utilitarian Boot and Shoe Stud Rivet—Oct. 15—4664—John Cadwallader, Madeley, Shropshire.
Chadburn's Lanterns for producing enlarged images upon a screen, &c., similar to the magic lantern, from opaque bodies, engravings, drawings, photographs, reliefs, natural objects, and for dissolving the same images one into another—Oct. 19—4665—Charles Henry Chadburn, Liverpool.
Latch for doors, cupboards, and other articles—Oct. 21—4666—William Tonks and Sons, Birmingham.
Grass Cutting Machine—Oct. 22—4667—William Smith, Barnard Castle, Durham.
A Glove Fastener—Oct. 24—4668—J. W. Williams, Worcester.
A Set of Fastenings for the Stay Busk—Oct. 24—4669—Drew and Son, Bath.
The Fragrant Cloud Maker, or "La Bouffée Odorante et Frigorifique"—Nov. 11—4670—Messrs. Piesse and Lubin.
A Double Laundry Trough—Nov. 14—4671—Thos. Bradford, Fleet-street, Liverpool.
A Tobacco Pipe—Nov. 14—4672—James McAlpin, 28, Victoria-street, Manchester.